MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

BCP 2214 – COMPUTER PROGRAMMING

(All sections / Groups)

21 OCT 2016
3.00 p.m. - 5.00 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **TWO (2)** printed pages with four essay questions.
2. Answer ALL questions.
3. The answer should be written in the answer booklet.

Instructions: Answer all questions. Write your answer in the answer booklet.

QUESTION 1 (25 MARKS)

(a) Write a program that inputs an integer that represents a length of time in seconds. The program should then output the number of hours, minutes, and seconds that corresponds to that number of seconds. For example, if the user inputs 50391 total seconds then the program should output 13 hours, 59 minutes, and 51 seconds.

(10 marks)

(b) Write a program that calculates the total grade for N classroom exercises as a percentage. The user should input the value for N followed by each of the N scores and totals. Calculate the overall percentage (sum of the total points earned divided by the total points possible) and output it as a percentage. (15 marks)

QUESTION 2 (25 Marks)

(a) Write a function that computes the average (technically, the *arithmetic mean*) and standard deviation of four scores, s1, s2, s3, and s4. The average is

a = s1 + s2 + s3 + s4;

The standard deviation, stdDev, is the square root of the average of the squares of the differences of the s values and the average, a.

stdDev = sqrt((s1 – a)^2 * (s2 – a)^2 * (s3 – a)^2 * (s4 – a)^2)

The function takes six parameters and calls two other functions to do the average and standard deviation of the scores.

(10 marks)

(b) Differentiate call by reference and call by value with a suitable example.

(15 Marks)

QUESTION 3 (25 Marks)

(a) Generate a text-based histogram for a quiz given to a class of students. The quiz is graded on a scale from 0-5. Write a program that allows the user to enter grades for each student. As the grades are being entered the program should count, using an array, the number of 0's, the number of 1's, the number of 2's, the number of 3's, the number of 4's, and the number of 5's. The program should be capable of handling an arbitrary number of student grades.

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You can do this by making an array of size 6 where each array element is initialized to zero. Whenever a zero is entered, increment array(0). Whenever a one is entered, increment array(1), etc. up to array(5).

Output the histogram count at the end. For example, if the input grades are: 3,0,1,3,3,5,5,4,5,4 then the program should output:

1 grade(s) of 0
1 grade(s) of 1
0 grade(s) of 2
3 grade(s) of 3
2 grade(s) of 4
3 grade(s) of 5

(15 marks)

(b) Define a class named Money that stores a monetary amount. The class should have two private integer variables, one to store the number of dollars and another to store the number of cents. Add accessor and mutator functions to read and set both member variables. Add another function that returns the monetary amount as a double. Write a program that tests all of your functions with at least two different Money objects.

(10 marks)

QUESTION 4 (25 Marks)

Using Prime class, write a Program to check for prime numbers. Choose the appropriate class definition, constructors, calculate and show methods in the class Prime. Create the object instance main and invoke the respective methods.

(25 marks)

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